



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Akio Sakura

Appln. No.: 09/640,155

Filed: August 16, 2000

For: METHOD FOR MANUFACTURING  
SPARK PLUG AND SPARK PLUG

Attorney Docket No: 8481-033

Examiner: Karabi Guharay

Art Unit: 2879

MS After Final  
Commissioner for Patents  
U.S. Patent and Trademark Office  
P. O. Box 1450  
Alexandria, VA 22313-1450

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- ☒ Response  
☒ Return Receipt Postcard

Fee calculation and payment:

- ☒ No additional fee is required.  
☐ An extension fee in an amount of \$\_\_\_\_\_ for a \_\_\_\_\_-month extension of time under 37 C.F.R. § 1.136(a).  
☐ A petition or processing fee in an amount of \$\_\_\_\_\_ under 37 C.F.R. § 1.17(\_\_\_\_).  
☐ An additional filing fee has been calculated as shown below:

	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra
Total		Minus		
Indep.		Minus		
First Presentation of Multiple Dep. Claim				

Small Entity	
Rate	Add'l Fee
x \$9=	
x 42=	
+ \$140=	
Total	\$

Other Than Small Entity	
Rate	Add'l Fee
x \$18=	
x \$84=	
+ \$280=	
Total	\$

Fee calculation and payment:

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☐ Please charge Deposit Account No. 23-1925 in the amount of \$\_\_\_\_\_. A copy of this Transmittal is enclosed for this purpose.  
☒ The Commissioner is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925. A copy of this Transmittal is enclosed for this purpose.

Respectfully submitted,

*Douglas D. Fekete*

Douglas D. Fekete (Reg. No. 29,065)  
Attorney/Agent for Applicant

November 3, 2003  
Date

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

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Date: November 3, 2003 Name: Terry L. Wand

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*Terry L. Wand*

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**RESPONSE**

In response to the Office Action mailed September 3, 2003, Applicant respectfully requests the sole remaining rejection of the claims be withdrawn and that the application, with all claims, be allowed for the reasons set forth in the remarks herein.

**Remarks**

The Examiner's recognition of Applicant's invention by the allowance of claims 1-9 and 11 is gratefully acknowledged.

**Claims Rejection Under 35 U.S.C. 103**

Claims 10 and 12 stand rejected under 35 U.S.C. §103 as unpatentable over Applicant's description of a known process for manufacturing spark plugs, which is included in the Background of the Invention in the present application.

The conventional method, as described in the application and summarized in the rejection, utilizes a rubber tube fitted onto the free-end portion of the ground electrode to prevent contact with the plating solution, page 3, lines 3-7. Because of the rubber tube, zinc plating and chromate treatment are limited to the exposed portion of the ground electrode.

At issue, raised by the rejection, is whether the chromate treatment is applied to the end face of the zinc-based plating layer that is formed against the rubber tube. There is no question, and the rejection does not dispute, that in Applicant's invention, the chromate treatment extends over the end face of the zinc-based plating layer on the ground electrode, as shown in Fig. 6c and described on pages 11 and 27.

Rather, the Examiner has taken the position that it is obvious that chromate treatment liquid treats the surface in the conventional method despite the rubber tube. This is based on the Examiner's view that a gap is present to allow access by chromate treatment liquid. Nothing in Applicant's description points to any such gap. No other reference is cited to show such gap. Thus, the rejection relies totally upon the Examiner's speculation without the benefit of any report based upon observation or experimentation.

Moreover, there is a question as to the gap to which the rejection refers. The rejection points -twice- to "the gap between rubber tube and the ground electrode." But the surface of the ground electrode is not at issue. The relevant surface, for purposes of the present invention, is the end face of the zinc-based plating layer. The surface is formed during the plating process, where plating occurs up to the face of the rubber tube. There is no evidence to suggest that the plating process produces a gap to draw chromate treatment liquid to the end face in the subsequent step.

Therefore, the rejection is based on speculation that does not address a key feature of the invention as set forth in the rejected claims. The Examiner's reasoning that "a finite gap between the rubber tube and the ground electrode" exists does not go to treating the end face of the zinc-based plating layer. It is not disputed that, in Applicant's invention, in the absence of the rubber tube, the end face of the zinc-based plating layer is treated by the chromate treatment liquid. Accordingly, the rejection should be withdrawn.

Claim 10 is directed to Applicant's method for manufacturing a spark plug that includes immersing the metallic shell in a chromate treatment liquid. As recited in

the claim, the axial end face of the zinc-based plating layer is subjected to chromate treatment. There is no dispute that Applicant's method, carried out without the rubber tube, provides ready access to the chromate treatment liquid for treating the axial end face of the zinc-based plating layer. In the conventional method, the end face is formed against the rubber tube and is protected thereby from the chromate treatment liquid. Therefore, it is respectfully requested that the rejection of claim 10 be withdrawn, and that the claim be allowed.

Claim 12 is dependent upon claim 10 and not suggested by the rubber tube method for the reasons set forth with regard to that claim.

Therefore, it is respectfully requested that the rejection of claims 10 and 12 under 35 U.S.C. §103 be considered and withdrawn, and that the claims be allowed.

Claims 13-15 stand rejected under 35 U.S.C. §103(a) as unpatentable over Applicant's description of the rubber tube method in view of U.S. Patent Number 4,581,558, issued to Takamura et al. in 1986.

For the reasons set forth with regard to the rejection of claims 10 and 12, the rejection speculates upon the presence of a gap to provide access to the end face of the zinc-based plating layer by chromate treatment liquid. Takamura et al. describes a spark plug that includes a metal chip welded to the electrode. However, Takamura et al. does not describe applying zinc plating or chromate treatment to the ground electrode. Thus, Takamura et al. cannot point to any such gap. Thus, Takamura et al. cannot make up this key deficiency in the reasoning of the rejection.

Claim 13 is directed to Applicant's spark plug that includes a chromate layer covering the end face of the zinc-based plating layer. There is no dispute that this occurs in the claimed method. The speculation of the Examiner does not substitute for a teaching that shows this feature in conventional spark plugs. Therefore, it is respectfully requested that the rejection of claim 13 be withdrawn.

Claim 14 also includes the feature that the chromate layer covers the axial end face of the zinc-based plating layer, similar to claim 13. There is no teaching in the art to suggest this feature, except by unsupported speculation. Therefore, it is

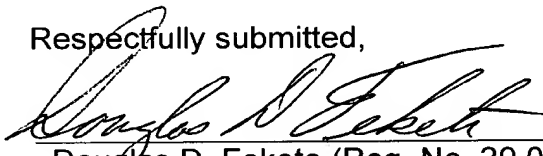
respectfully requested that the rejection of claim 14, and claim 15 dependent thereon, be reconsidered and withdrawn.

Applicant's invention applies a chromate treatment layer to an end face of a zinc-based plating layer on a ground electrode of a spark plug. This feature is not found in prior art electrodes, and mere speculation is not sufficient to substitute for a clear teaching that would be obvious to the skilled practitioner. Accordingly, it is respectfully requested that the rejection of claims 10 and 12-15 based, in whole or part, upon the rubber tube method be reconsidered and withdrawn, and that said claims be allowed, along with claims 1-9 and 11, already allowed in the case.

If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at 734-302-6000.

Nov. 3, 2003  
Date

Respectfully submitted,

  
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(734) 302-6000